CROSS EDUCATIONAL SOFTWARE
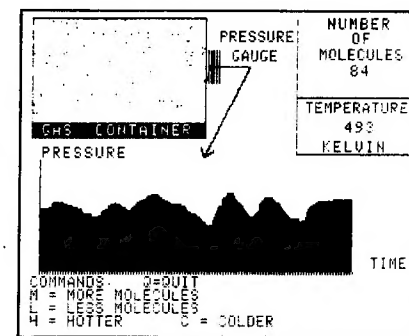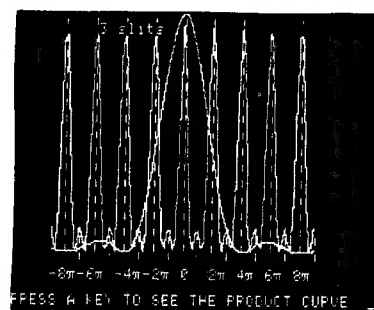
Programs for Apple® Computers

June 1983

PHYSICS LAB
°LIGHT   °HEAT   °SOUND

GENERAL PHYSICS
12 VOLUMES - 114 PROGRAMS

TEACHER AIDS
- GRADE REPORTER   - TEXT EDITOR
- CREATE-A-TEST WITH QUESTION FILES

CHRISTIAN EDUCATION
ELEMENTARY GAMES

GENERAL PHYSICS

This is a complete series designed to accompany introductory physics courses. The average level of the programs is intended for college freshmen. About one third of the programs are suitable for high school students and some are for advanced physics majors.

These programs were written by physics teachers with many years of experience in both college physics teaching and Apple computer programming. They have used graphics as much as possible. They have also paid close attention to the placement of text and pictures on the screen and have added animation and color emphasis when needed. In order to make the programs more interactive, most pages of information ask the user to press a key to indicate that he understands and is ready to go on. The problems allow one or two attempts at a solution and then give the right answer.

These disks are not copy protected. It is standard practice ("fair use") to make one copy of each disk and store the original in a safe place, but making more than one copy is a violation of the copyright law. If these programs will be run on several computers at once such as in a large learning lab, then the school should purchase permissions to make extra copies. The fee is 30% of the retail price for each copy permission. It is 15% for each computer after the first connected to a hard disk network.

Cross Educational Software responds to institutional requests for bids by quoting the listed price. U. S. orders for eight or more disks will be put in a three ring binder.

VOL. 1: VECTORS & GRAPHING - $15.00

This disk contains seven vector pro-
grams plus a longer program about
how to graph lab data. *DATAGRAPH*
teaches how to set up a graph, fit a
line to data, and calculate the inter-
cept and slope of the line. See the
review in "The Physics Teacher"
January 1983, page 49.

VECTOR RESOLUTION
VECTOR QUIZ
VECTOR ADDITION
VECTOR ADDITION 2
CROSS PRODUCTS
DOT PRODUCTS
VECTOR PRODUCTS WITH UNIT
　VECTORS
DATAGRAPH
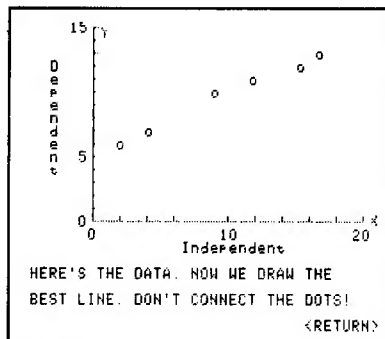
VOLUME 2: STATICS - $20.00

These five programs teach the pro-
cedures for solving statics problems.
Each problem is illustrated and
vectors are drawn at appropriate
points. Some of the problems ask
students to use their own calcula-
tors while working along with the
computer. See the review in "The
Physics Teacher" February 1983,
page 117.
STATICS: METHOD
EASY BEAM PROBLEM - LADDERS
INCLINED PLANES
BEAM PROBLEMS
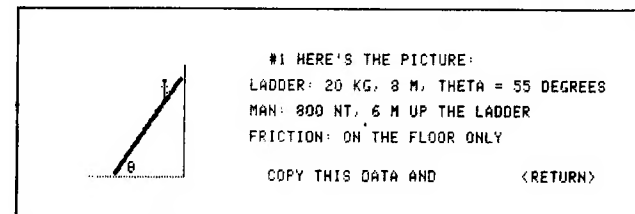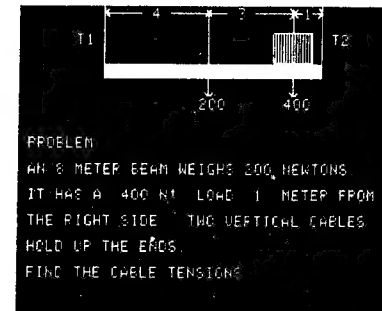
VOLUME 3: MOTION - $20.00

This full disk contains nine programs. They teach how to solve motion problems. *GRAPHING MOTION* uses the concepts of slope and area for students who are just starting to learn calculus. *ONE DIMENSIONAL KINEMATICS* and *GRAVITY PROBLEMS* solve constant acceleration problems in one dimension. *PROJECTILE* shows how the X and Y motions are independent. *MOTION ON AN INCLINED PLANE* and *ROTATIONAL MOTION* are more advanced and require resolution of forces.

GRAPHING MOTION PARTS 1, 2, 3 - ONE DIMENSIONAL KINEMATICS
GRAVITY PROBLEMS - PROJECTILE - ROTATIONAL MOTION
DYNAMICS: GENERAL METHOD
MOTION ON AN INCLINED PLANE
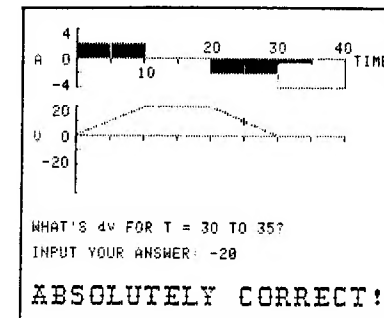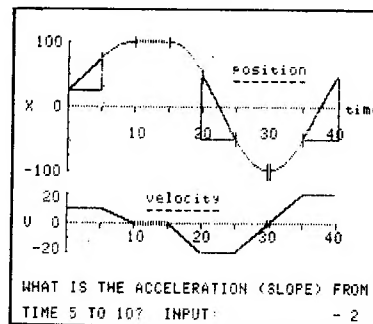
VOLUME 4: CONSERVATION LAWS - $20.00

This disk contains eight programs on conservation of momentum, energy, and angular momentum which emphasize collisions. One and two dimensional collisions are discussed. Several programs show how to solve problems. *CONSERVATION OF ENERGY* (shown) starts with the energy in the compressed spring and calculates the height the projectile will rise. *BOUNCING BALL* is a game that shows how kinetic and potential energy vary during the bounce while total energy is conserved.

```
INITIAL                    FINAL

                    □

                                h = ?

        □
                           ▨

          HERE IT IS.

   THE PROBLEM IS TO FIND (h).
                              <RETURN>
```
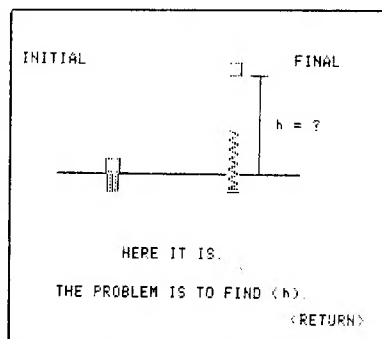
LINEAR MOMENTUM - ANGULAR MOMENTUM
BOUNCING BALL - CONSERVATION OF ENERGY
CONSERVATIVE FORCES - NON-CONSERVATIVE FORCES
INELASTIC COLLISIONS - ONE DIMENSIONAL COLLISIONS

VOLUME 5: CIRCULAR MOTION - $20.00

Four programs on this disk discuss the problem solving methods for circular and harmonic motion. The other two programs on orbits use graphics to explain what holds up a satellite according to Newton's laws and also give the centrifugal force explanation. The round orbit game could be used with a class discussion of why a satellite that tries to go faster will find itself in a higher, *SLOWER* orbit. The picture is part of the quiz after *ORBIT THEORY.*

```
NEXT   QUESTION:

PRESS ANY KEY WHEN GRAVITY IS WEAKEST

          . . .

                      •

    Q
     ·.
      x

Gravity is weakest at the aposee.
```

CIRCLE 1 - CIRCLE 2 - SHM 1 - SHM 2
ORBIT THEORY - ROUND ORBIT GAME
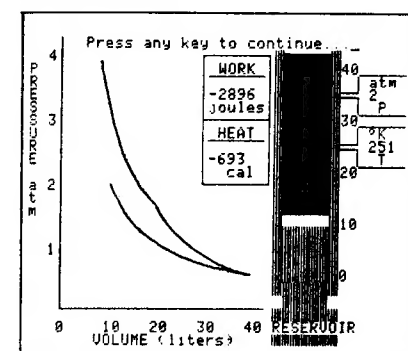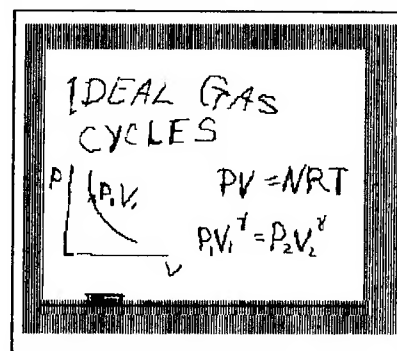
VOLUME 6: THERMODYNAMICS - $20.00

These programs are for more advanced students. *IDEAL GAS CYCLES* can plot the standard processes one at a time to build up a complete cycle on a PV diagram. It can show a Carnot cycle drawn to scale on a PV diagram to give an idea of how thin it is. *GAS MOLECULE MOTION* shows pressure fluctuations due to over 100 particles hitting the wall at random, with fast machine language animation. *CALORIMETRY* discusses the calculations that go with a specific heat lab experiment.

CALORIMETRY - THERMODYNAMIC PROCESSES
   THERMODYNAMIC CYCLES
ENGINES: THEORY - ENGINES: APPLICATIONS
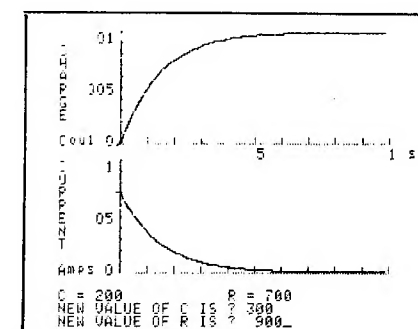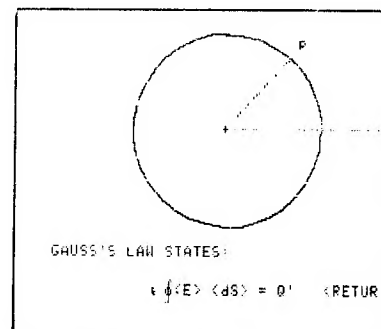GAS MOLECULE MOTION - IDEAL GAS CYCLES

```
IDEAL GAS
CYCLES

P |(P,V,    PV = NRT

  L         PV₁ᵞ = P₂V₂ᵞ
        V
```

$PV = NRT$

$PV_1^{\gamma} = P_2 V_2^{\gamma}$

```
            Press any key to continue.
                          ┌──────┐     40
P                         │ WORK │   atm
R  4                      │-2896 │    2 P
O                         │Joules│
C                         ├──────┤    30
E  3                      │ HEAT │   °K
S                         │ -693 │   251
S  2                      │ cal  │    20
     a                    └──────┘
     t
     m 1                              10

        0  10  20  30  40 RESERVOIR
           VOLUME (liters)
```
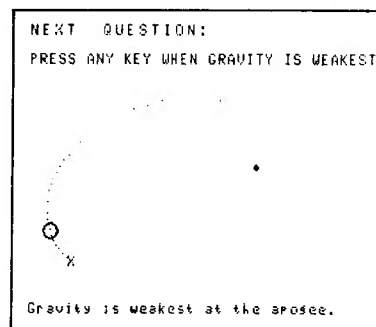
VOLUME 7: ELECTRICITY & MAGNETISM
$20.00

These programs should be used only with students at the calculus level. They cover the traditional physics topics related to field theory and circuits. *GAUSS'S LAW* and *AMPERE'S LAW* each apply the laws to one example problem. *RESISTOR AND CAPACITOR COMBINATIONS* work with series and parallel circuits. *RC CIRCUITS* plots the charge and current graph shown below. *RCL CIRCUITS* solves problems in AC impedance. *LORENTZ FORCE* teaches the vector direction of the force.

GAUSS'S LAW - AMPERE'S LAW - RESISTOR COMBINATIONS
CAPACITOR COMBINATIONS - RC CIRCUITS - RCL CIRCUITS
LORENTZ FORCE

```
                          P




              +



   GAUSS'S LAW STATES:

     ∮<E> <dS> = Q'   <RETUR
```

```
        01


   .105



Coul 0

     1


     05


AMPS 0

C = 200          R = 700
NEW VALUE OF C IS ? 300
NEW VALUE OF R IS ?  900_
```

VOLUME 8: OPTICS - $20.00

The first three programs cover ray diagrams used in geometrical optics. The last three discuss physical optics for more advanced students. The waves program has a very fast action demonstration of standing waves that can be single stepped for use during a lecture.

OPTICS received a price/usefulness ratio of 95 in *The Book of Apple Computer Software 1982.* Jeffrey Stanton wrote "The entire package provides an excellent tutorial on several topics in optics. The programs reside on two sides of the disk. At $20 *OPTICS* is a bargain for computer aided instruction in any college physics course."

MIRROR RAY DIAGRAMS - LENS RAY DIAGRAMS
TYPES OF IMAGES - WAVES - DIFFRACTION - LASER
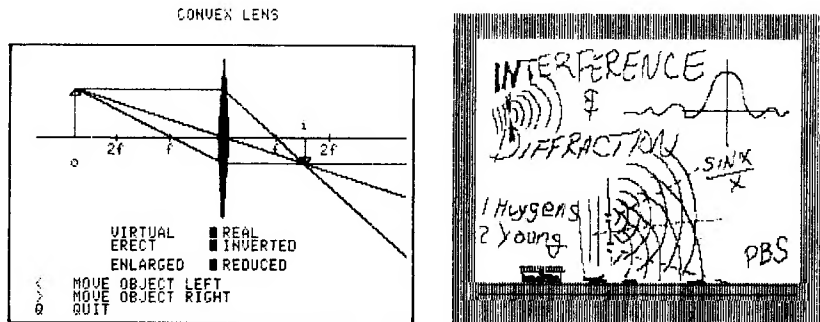
VOLUME 9: ATOMIC PHYSICS - $30.00

These programs teach the structure of atoms and the causes of radioactive decay. Some use little math and thus are suitable for high school courses. *ATOMIC MODELS* presents the historical development of atomic models from Democritus through the electron clouds of quantum mechanics. *RUTHERFORD SCATTERING* is the most advanced program on the disk. It requires the student to calculate the distance of closest approach and scattering angle of an alpha particle to win a target-shooting game. He will be successful if he can derive a scattering angle formula from two equations given in the program.

ATOMIC MODELS - ELECTRON CLOUDS - PARTICLES AND WAVES
RADIOACTIVE DECAY - NUCLEAR REACTIONS - RUTHERFORD
  SCATTERING
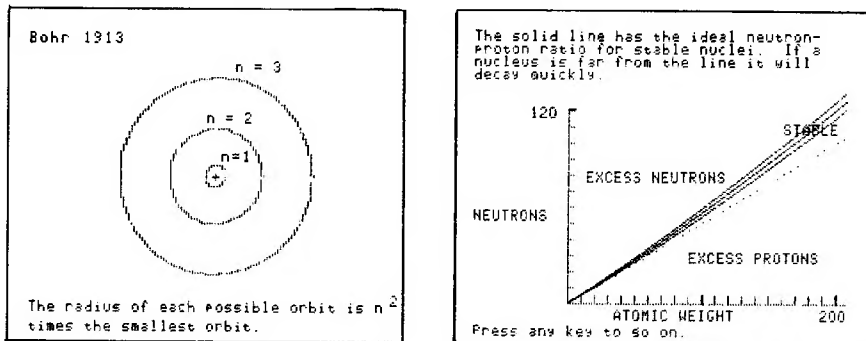
These two astronomy volumes can be understood by non-science students and those who can't use algebra. Nevertheless, they explain advanced physical concepts. They could be used in a ninth grade physical science class or a college physical science survey course as well as in introductory astronomy.

VOLUME 10: SOLAR SYSTEM ASTRONOMY $30.00

INNER PLANETS and *OUTER PLANETS* give up-to-date information on the planets and their moons including data from NASA fly-bys during the last ten years.

SOLAR SYSTEM HISTORY
GREENHOUSE EFFECT
LIFE IN THE SOLAR SYSTEM
COMETS
INNER PLANETS
OUTER PLANETS
PADDLE GRAPHICS
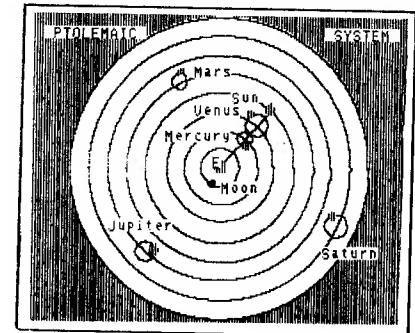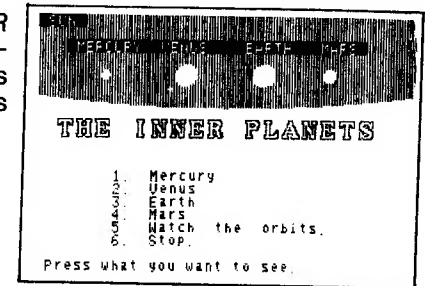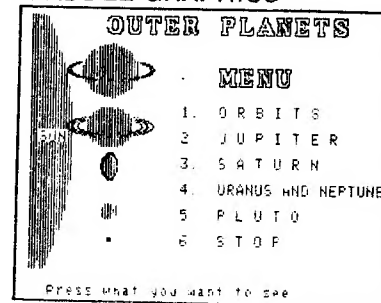
VOLUME 11: STELLAR ASTRONOMY - $30.00

TYPES OF STARS draws an H-R diagram and explains main sequence stars, novas and super novas. white dwarfs, red giants, blue giants, and variable stars. *COSMOLOGY I* discusses physical theories for the origin of the universe and *COSMOLOGY II* explores other philosophical possibilities.

CONSTELLATIONS
SIRIUS & THE WHITE DWARF
DOPPLER EFFECT
TYPES OF STARS
DEATH OF A STAR - GALAXIES
COSMOLOGY I-COSMOLOGY II
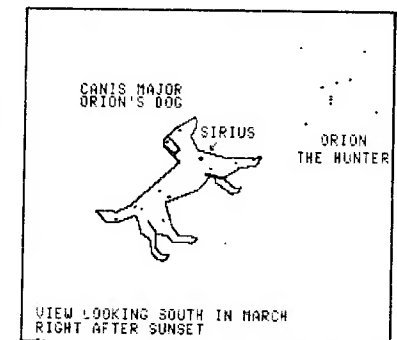
VOLUME 12 - PHYSICS GEMS - $35.00
by Dr. Carl Rutledge

These programs fill in many of the details in a physics education. Some are lecture aids and others give individual instruction in the fine points that confuse students year after year. Color pictures, animation, and user inputs make them better than textbooks. You get a full disk of over 30 programs from an experienced college teacher. Here are some of the questions dealt with:

How much more does energy cost when you put a few more windows in a house and have more conduction?
What is the least squares fit to a set of lab data?
What do orbits and retrograde motion look like?
How do you draw Apple graphs and put labels on them?
What happens to a wave when you change its Fourier components?
How does thermal expansion change the area and volume?
What do equipotential lines look like for gravity and electricity?

HOME ENERGY - HOURLY	DAMPED HARMONIC MOTION
HOME ENERGY - DAILY	DAMPED DRIVEN SHM
BIG NUMBER FACTORIAL	SQUARE WAVE SYNTHESIS
RANDOM WALK	FOURIER SYNTHESIS
METRIC HT AND WT	FOURIER ANALYSIS
LEAST SQUARES FIT	GRAPH PAPER
COMPUTER INTRODUCTION	GRAPHICS TUTOR
GRADE AVERAGE	ELECTRIC EQUIPOTENTIALS
HGR2 PICTURE SAVER/GETTER	GRAVITATIONAL EQUIPOTENTIALS
SINE SIGN	MOONFLIGHT
STOPWATCH	WEIGHT ON THE PLANETS
TWO PADDLE TIMER	COMET
TEXT ON HI-RES GRAPH	ELLIPSE
BOX OF MOLECULES	RETROGRADE
THERMAL EXPANSION	REACTION RATES
FINDING ABSOLUTE ZERO	SQUARE ROOT GAME

DAMPED HARMONIC MOTION

LEAST SQUARES FIT
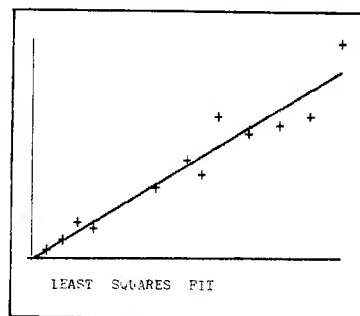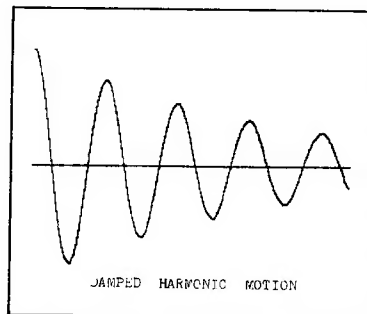
LAB INTERFACES

These are kits of parts that can be assembled in about an hour. They plug into the Apple game connector (paddle). The computer becomes a general purpose lab instrument that substitutes for instruments that might not be available otherwise. Some new experiments become possible with the computer. Each kit gives part numbers or sources so more lab interfaces can be built. Additional kits of parts only can be purchased directly from Cross Educational Software. The accompanying disk has programs to calibrate the lab interfaces and demonstrate each experiment.

LIGHT - $60.00

Four phototransistors are included. One is enough to time a pendulum. Two can measure a speed as an object passes in front of them and interrupts the light. All four can measure two speeds at once and follow an inelastic collision on an air track. With more effort a two-body elastic collision can be timed.

The acceleration of gravity can be done on the table top beside the computer. More advanced students can look for air resistance slowing down light balls as they fall. The computer's time resolution is .001 second or better, depending on the light intensity.

Add a light bulb and this interface will measure the relation between light intensity and distance. With a voltmeter and ammeter you can also measure the efficiency of a light bulb.


Ball

Photo-transistors

Computer
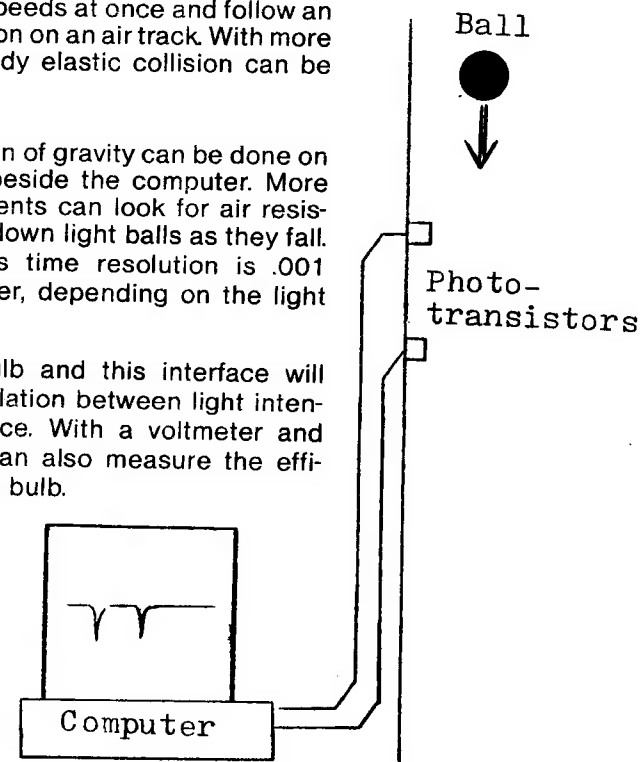
LAB INTERFACES

HEAT - $60.00

The kit includes a connector, wire, and thermistors to be plugged into the game connector socket. The temperature is measured to a precision of a tenth of a degree after calibration against the user's thermometer. Up to four thermistors can be used.

Two programs read the thermistors. One continuously prints the temperatures. The other graphs temperature versus time with a time step of from 1 to 1000 seconds. The graph can be a cooling curve that lasts just a few minutes, or a three day chart of the outdoor temperature.

Suggested experiments:
Cooling curves of paraffin and mothballs
Solar heat gain in an enclosure
Specific heat by the method of mixtures
Thermal radiation (Measure the Stefan-Boltzman constant.)
Temperature vs. depth as soil is warmed by the sun or a light bulb
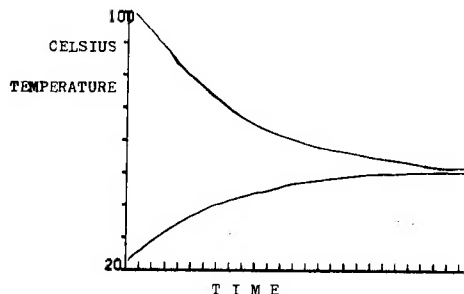
TIME VS. TEMPERATURE GRAPH
FOR UP TO 4 THERMISTORS

SOUND - $60.00

The kit includes a manual, programs, speaker, microphone, transistors, and other parts for building the game paddle interface. Assembly takes about two hours. The sound lab lets the computer do the work of specialized audio equipment.

AUDIO SPECTRUM ANALYZER: The computer samples a short sound from the microphone. Then it does a fast Fourier transform and displays the frequency components. Applications include speech study and vibration analysis. The upper frequency limit is over 1000 Hertz, but lower frequencies can be used for vibration analysis.

AUDIO OSCILLATOR: The Apple produces audio frequencies and displays them on the screen while playing them on either the external speaker or Apple's internal speaker. Keyboard commands change the frequency. Possible experiments include the frequency ranges of the speaker and human ears, beats between two speakers, and resonance in bottles.

SPEED OF SOUND: This measurement is difficult, but the speed can be found from the travel time from speaker to microphone. Also the microphone is small enough to pick up peaks in a standing wave pattern and measure the wavelength of sound.
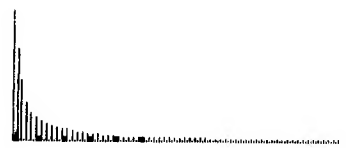

SOUND FROM A MICROPHONE
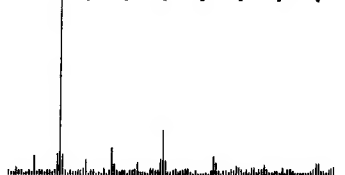
SQUARE WAVE

FREQUENCY COMPONENTS

ODD NUMBERED FREQUENCY COMPONENTS

CREATE - A - TEST

PROGRAM DISK $89.95

The CREATE-A-TEST program enables teachers to select questions from a question bank and print them out in a perfectly formatted test. These questions may be changed so that each class receives a different test.

A teacher begins with the question files listed below or makes up his own. Each disk holds over 400 questions. Up to 100 questions may be selected to make up a test. They can be multiple choice, essay, fill in the blanks, or virtually any other type. One test is printed without answers and another is printed with answers after the questions for a key. In 10 minutes a new test can be completely printed and ready to duplicate. The program includes a text editor for typing in new questions.

The program will operate on most printers. Some printers can make mimeograph stencils. A printer with subscript ability makes the chemistry formulae look better but is not required.

CREATE-A-TEST QUESTION FILES

(Requires Program Disk above) $49.95 EACH

Each question file has about 400 to 450 questions including multiple choice, matching, essay, etc. Answers are stored with the questions. A printed booklet lists all of the questions without answers. To make up a new test just run the CREATE-A-TEST program and select questions from one of the files listed below. Questions can be selected in any order and may be taken from several question disks.

CHEMISTRY QUESTION FILES

These 14 chemistry files have over 6000 questions on 100 topics. They can be used from the eleventh grade in high school through the second year of college. Questions from more than one disk can be combined by the Create-A-Test program into a single test.

Disks 610 through 619 came from the Ontario Assessment Instrument Pool.

CREATE-A-TEST QUESTION FILES $49.95
(Requires Program Disk page 11) **Each**

CHEMISTRY QUESTION FILES CONT.
CHEM 601 - Nomenclature, chemical terms, atomic diagrams, periodic table, blancing equations, gas laws, kinetic molecular theory, mole concepts, molecular formula, compositions, stoichiometry.

CHEM 602 - Advanced stoichiometry, neutralization, acids, bases, indicators, solutions, polar bonding, molecular shapes-angles-and dipoles, redox, experiments, Avogadro's principle, atomic structure, simplest formula determination, Dalton's law of partial pressures.

CHEM 603 - Dalton's and Graham's diffusion laws, general chemistry, solutions and solubility, molarity calculations, advanced stoichiometry, limiting factor, redox, Faraday, Rutherford, Millikan, Thomson, mass spectrograph, enthalpy, delta H of formation, calorimetry problems, rates, Lechatelier's principle, equilibrium, K-s.p. problems.

CHEM 604 - Bronsted-Lovry acids, PH problems, buffers, neutralization, periodic table generalities, wave equation. Planck's constant, electron energy levels, transitions, orbitals, ionization energies, bonding, solids, inter & intramolecular bonds, molecular shapes and dipole moments.

CHEM 610 -Essay questions, stoichiometry, percent compositions, solubility equilibrium, redox, acids-bases-PH, periodic table, enthalpy, salts-acidity, bonding, quantum chemistry, nuclear chemistry, decay rates, periodic table.

CHEM 611 - Mixtures & pure substances, elements & compounds, changes-chem-phys, atomic structure, atomic mass, isotope, ions, atomic structure, elec. energy levels.

CHEM 612 - Atomic structure, electronic configs, bonding theory, bonding-aggregates, formulas, covalent bonding, K.M.T.; states-gases, gas laws.

CHEM 613 - Gas laws, combustion, hydrogen-Dumas, chemical reactions, oxygen-oxides, hydrogen, moles-avogadro, GMM & molar volume, KMT-% compositon, molar mass, ideal gas law, formulas-atom ratio, % composition.

CHEM 614- Naming formulars, stoichiometry, mole-gram formulae, mole-gram balancing, nomenclature, Avogadro balancing, hydrates, solution concentration, % water in hydrates.

CHEM 615 - Solutions-hydrates, electrolytes-ions, acids-bases-salts, periodic table & reactivity.

CHEM 616 - Energy effects, rates of reactions, reaction equilibrium, solubility equilibrium.

CHEM 617 - Solubility equilibrium, acids & bases-water, oxidation-reduction.

CHEM 618 - Atom theory basis, electrons in periodic table, gas phase molecules, bonding in solids, liquids.

CHEM 619 - Bonding-solids-liquids, chemistry of carbon, row 4 transition elements, row 6 & row 7.

CREATE-A-TEST QUESTION FILES $49.95
(Requires Program Disk page 11) **Each**

BIOLOGY QUESTION FILES
BIOLOGY 701 - Over 400 questions at the tenth grade level: Cellular structure, physiology, mitosis and differentiation; diffusion & osmosis; plants: photosynthesis, gas exchange, role in ecology.

BIOLOGY 705 - Respiratory systems, amoeba, worm, insect, frog, fish, respiration-man, digestion-insect, digestion-frog, digestion-man, food tests, nutrition, functioning animal, genetics, ecology.

PHYSICAL SCIENCE QUESTION FILES
PHYSICAL SCIENCE 702 - Introductory chemistry and physics at the ninth grade level including measurement, density, speed and structure of matter.

PHYSICAL SCIENCE 703 - Chemical change, chemical equations, qualitative tests; work, forms of energy, conservation of energy.

PHYSICS QUESTION FILE
PHYSICS 704 - Heat, light, and astronomy (12th grade).

GRADE REPORTER $19.95

These two programs take data from a teacher's grade book, compute averages and grades, and then prepare reports. One program is best for large classes. Its reports are condensed and keyed by student code numbers so they can be posted on a bulletin board. It also makes bar graphs of test scores. The other program is better for classes of 30 or less. It prepares very detailed reports that can be given to each student. The reports show the weight, name, and percentage for each assignment and a weighted average for the whole course.

These programs have been developed and used for over three years at several colleges. They quickly show students what happens to their grades when they don't do homework! Frequent grade reports also reduce the complaints from students whose final grades are less than they expected.

PEACHY WRITER $24.95

PEACHY WRITER is a line-oriented text editor. With it you can create text, edit it, and print it out. You can insert control characters in the text to use special features of your printer. This text editor should be very easy to learn because there are only four special format commands to memorize.

PEACHY WRITER has been compiled into machine language for extra speed. Both the Applesoft and compiled versions are included on the disk. Here is the primary menu. The 12 page manual explains each option.

(W)	WRITE NEW MATERIAL
(E)	DISPLAY AND EDIT MATERIAL
(R)	READ A FILE FROM THE DISK
(S)	STORE THE FILE ON A DISK
(D)	DELETE A FILE FROM THE DISK
(C)	CATALOG
(P)	PRINT THE FILE TO A PRINTER
(H)	HELP - DIRECTIONS
(X)	START OVER (RESET MARGINS)
(Q)	QUIT

PEACHY WRITER BOLD is included for people whose vision is weak. The letters are printed double size, 20 across the screen by 12 lines vertical. The printout can be normal or double size if an Epson printer is used.

Here are exerpts from Softalk Magazine's September, 1982 review of Peachy Writer:

Have you ever looked at your Apple and thought, "I don't need a fancy word processor, but it would be nice if I could use this system as a typewriter once in a while?" If so... this may be just the program you're looking for.

It's a word processor reduced to the absolute minimum, with the emphasis on ease of learning. The manual calls it a "text editor," but it's more than that. It includes a text editor, all right; but it also has disk management routines (store, retrieve, delete, and catalog), a printer formatting menu, and a useful help file. Not bad for less than thirty dollars!

The system's main problems derive from limitations of the Apple display - the lack of lower-case characters, and the forty-character line length.

The lower-case problem is taken care of by having everything print in lower case, unless preceded by a slash mark (/). The solution to the forty-character line problem is similar - simple and effective, but somewhat odd-looking on the screen. If you set the system up for a line length of more than forty characters, each line will be folded in such a way that it ends on the right margin: thus if you set for a sixty-five character line, each typed line would begin fifteen characters in from the left margin and extend for two lines on the screen, ending the second line at or before the right margin. Three different tab commands are available.

The editing commands are the familiar Apple left and right arrows and escape-IJKM (or escape-ABCD), plus commands to examine, delete, insert, or modify selected lines.

Finally, one quite sophisticated feature: the system supports a wide variety of printer control characters, embedded in the text. This includes both true control characters (which display as inverse, for editing) and escape sequences.

In short, *Peachy Writer* is a simple but effective "text management system:" a set of routines that manipulate the existing capabilities of your Apple in order to produce text, either on disk or on paper. It's not quite a "word processor," from the professional writer's point of view, but it's a handy tool for the nonspecialist who only occasionally wants to produce text with his Apple.

AQUARIUM $25.00

COMMUNITY AQUARIUM is an aquarium simulation. It has zebra fish, angelfish, neon tetras, bettas, male guppies, female guppies, and 4 sizes of baby guppies. You can add and remove plants, fish and the air bubbler and you can also feed the fish. The fish swim, chase each other, breed and grow up. They are fascinating to watch.
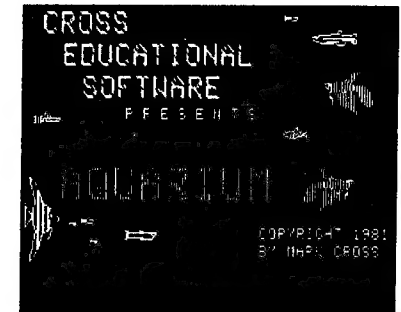

This disk also has four games:

AQUARIUM FISHING: From a tiny boat on top of the aquarium you can fish for guppies and neon tetras. Catching a large betta, zebra, or angelfish breaks your line.

FISH FOOD RACE: Two fish score points by racing for food. The game can be played by two people or by one person against the computer.

ZEBRA FISH ZOT: You steer the zebra fish to chase baby guppies.

*GUPPY CHASE:* A male and female guppy race for food. He also scores points by catching her.
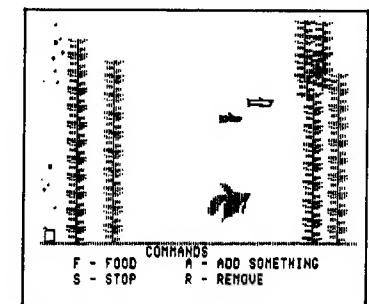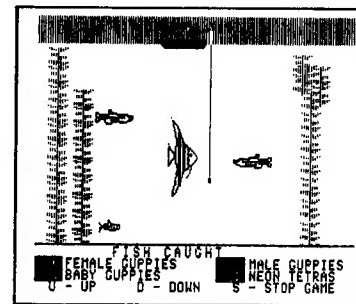
HAPPY FACE is no longer available from Cross Educational Software. It is being marketed now by Spinnaker Software under the title Rhymes & Riddles. Ask for it from your local dealer or order directly from Spinnaker Software, 215 First St., Cambridge, MA 02142. Atari and IBM versions are also available.
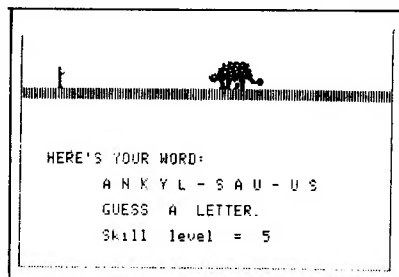
DINOSAURS $15.00

In *FIRE FIGHT* the player is a flame shooting Tyrannosaurus. Three kinds of dinosaurs attack him: Pteranodons from the air, Brontosaurs straight ahead, and Triceratops from below. The Tyrannosaurus moves his head up and down to shoot fire at the attackers. He gets more points if he charges the attackers and speeds up the action. The high score depends very strongly on the player's skill and coordination.
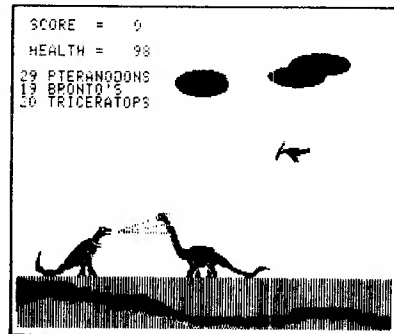
DINOSAUR HANGMAN is a fact action game with ten skill levels. While you are spelling the name of a dinosaur, he creeps toward you. You win if you spell his whole name before the dinosaur reaches you. You can shoot and push him back a few steps by guessing right letters. There are eleven different dinosaurs. The Zeuglodon will get you if you don't watch out!

BRONTO IN THE SWAMP is a graphics demo of a Brontosaurus lumbering through his swamp and meeting a hairy, apelike creature. The Brontosaurus shoots fire at the ape.

DINOSAUR MATCHING is a quiz about the names of ten dinosaurs. They move around with sound effects while waiting for the player's input.
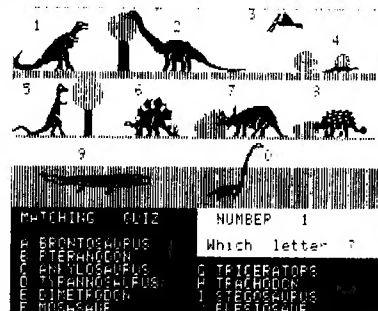
PREHISTORIC SCENE can entertain pre-schoolers. They get to put dinosaurs in and remove them from a background scene. The dinosaurs move and a volcano erupts.

PADDLE GRAPHICS drew the backgrounds for the dinosaur scenes. It is included for people who want to draw their own pictures.

CHRISTIAN EDUCATION

## JONAH $6.00

Over 30 pictures in full color graphics illustrate the Bible story of Jonah. There are three reading levels: an adult paraphrase of the Bible text; easy words for Primaries; and no text for preschoolers. The program can be used like a flannelgraph story for Sunday Schools. A child can run through the pictures and tell or read the story to someone else as he goes, or the story can be read and applied by the teacher.
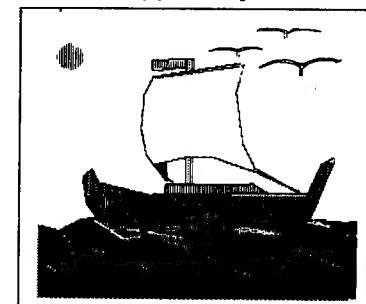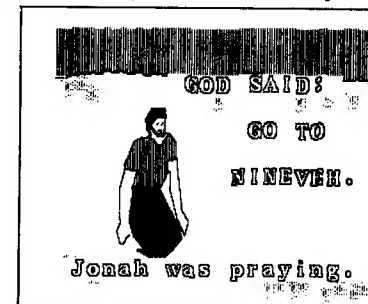
THE CHRISTMAS STORY - $12.00

This is a continuous half hour Apple-TV special in three parts. It can be run one segment at a time or else the whole story can repeat in an endless loop. "Prophecy" presents Old Testament Scriptures foretelling the birth of the Messiah-King. "Shepherds" describes the night of His birth and "Wise Men" tells of the visit of the Magi. The program contains the King James version of the birth of Christ and 7 hymns. It is extensively illustrated with high resolution graphics.
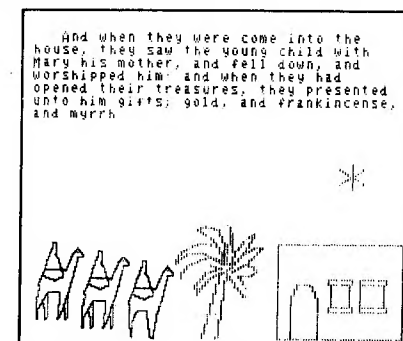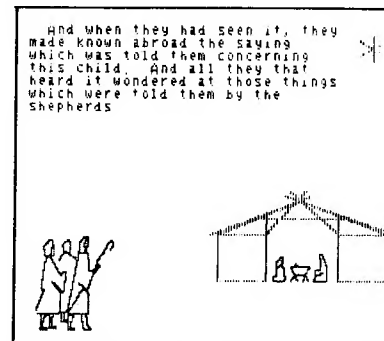
The Night Before Christmas and *The Story of Christmas* have been combined into *A Christmas Sampler* and are now being sold by Spinnaker Software, 215 First St., Cambridge, MA 02142. These programs are also available for Atari and IBM computers.

CHRISTIAN EDUCATION

BIBLE BOOKS AND HYMN BOOK PLUS THE METHODIST CHURCH $15.00

BIBLE BOOKS AND HYMN BOOK PLUS PRESBYTERIAN CHILD'S CATECHISM $15.00

BIBLE BOOKS begins with an introductory text about the structure and purpose of the Bible. It teaches the names of the Bible books through two hangman games. The Old Testament game lets the player start naming the books at Law, History, Poetry, Major Prophets, or Minor Prophets. The New Testament game starts at Gospels, Pauline Epistles, or General Epistles. Three songs are included with bouncing balls over the words: *"Books of the Old Testament,"* *"Books of the New Testament,"* and *"B-I-B-L-E."*

WHAT IS THE SECOND GOSPEL, AFTER MATTHEW?

GUESS ?
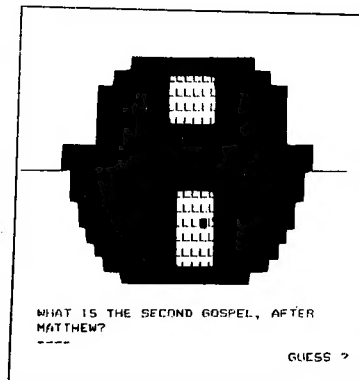
HYMN BOOK is a sing-along for individuals or small groups. It displays the words of 9 songs while moving a bouncing ball and playing the music. You can adjust the pitch and tempo. The songs are: *Doxology; Jesus Lover of My Soul; O For a Thousand Tongues to Sing; O For a Heart to Praise My God; Amazing Grace; A Mighty Fortress (first verse); What a Friend We Have in Jesus; Rock of Ages;* and *To God Be the Glory.*

PRESBYTERIAN CHILD'S CATECHISM teaches the 145 questions and answers of the Child's Catechism. It also teaches reading, spelling, and familiarity with the typing keyboard. Noah's Ark sinks as wrong answers are guessed. There are two drawings of the ark for variety. The catechism covers very basic areas of Christian doctrine and includes the Ten Commandments and The Lord's Prayer.

THE METHODIST CHURCH contains an essay on the history of Methodism emphasizing the work of the Wesleys. Two of Charles Wesley's hymns - "O For a Thousand Tongues to Sing" and "O For a Heart to Praise My God" - are included. There is also a Noah's Ark game teaching the Apostle's Creed and the 25 Articles written by John Wesley in 1784.

GRAPE is a Christian Apple users group with a newsletter called the GRAPEVINE. Membership dues including bimonthly issues of the VINE are $5.00 per year. Disks of member contributed programs can be purchased very inexpensively. For more information write to GRAPE, P. O. Box 576, Keyport, WA 98345.

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